28 February 2008

M E M O R A N D U M

TO: Thomas Rackow, P.E
Idaho Falls Regional Office

FROM: Tina Kurtz, Scientist I
Technical Services

SUBJECT: Idaho Pacific Wastewater Reuse Permit Application Review -- LA-000030-03 (Industrial Wastewater Facility)

1.0 Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400 (Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater) for issuing wastewater reuse permits. It states the principal facts and significant questions considered in preparing the permit conditions or intent to deny, and a summary of the basis for approval or denial with references to applicable requirements and supporting materials.

2.0 Process Description

Idaho Pacific (IP) operates a potato dehydrating facility located approximately 1 mile northeast of Ririe, Idaho. The facility owns 383 acres adjacent to the plant, 282 of which are currently employed for land application. As will be discussed below in Section 4.5.2.3 the facility seeks to bring into service additional acreage adjacent to the existing land treatment area in order to help reduce constituent and hydraulic loadings to their current site.

The IP plant is considered to be fully operational for approximately 330 days per year, generating an average 120.5 million gallons (MG) of process wastewater annually. Process water from the plant consists of overflow from pre-cookers, coolers, washers, trim tables, floor drains, and waste solids. The water is directed into the process flumes and then to either the hydro-sieve or barrel screen for primary treatment. Once separated from the solids, the residual process water is sent to the clarifier, after which it is pumped to the land application site.

3.0 Summary of Events

The facility received its initial wastewater reuse permit (LA-000030-01) on January 18, 1990. The pre-application meeting for re-permitting was held on April 18, 1996 and subsequent permit negotiation meetings were held on January 23, 1997 and June 6, 1997. A draft permit was issued on July 1, 1997 following which a consensus was finally reached between the facility, DEQ, and the Concerned Citizens Group. The final permit (LA-000030-02) was then issued on August 11,

1997. This permit contained a series of tiered hydraulic and constituent loading limits designed to reduce facility application rates to more acceptable levels by September 1, 1999.

In September of 1999 the facility notified the Department that they would be unable to meet the aforementioned conditions and consequently requested an extension of one year. DEQ granted this extension contingent upon the facility's completion of the following items during the interim period: replacing one scrubber with a dry scrubber, sending blancher water directly to the pump pits and thereby bypassing the clarifier, abandoning the mud lagoons, and incorporating enough additional land for wastewater application to accommodate the new permit limits (i.e. limits as of September 1, 2000). The scrubber system was replaced in January 2000 and the mud lagoons were abandoned in November 2000 and replaced with a silt clarifier system. The facility deemed their efficiency such that bypassing clarifier with the blancher water was unnecessary (CES, 2005). In September of 2000 the facility petitioned to incorporate an amount of additional acreage adjacent to their current land application area. DEQ elected to incorporate this acreage into the next permit cycle.

The current permit (LA-000030-02) expired on August 11, 2002 and an application for renewal was submitted by the facility on August 8, 2002. On November 1, 2002, DEQ administratively extended LA-000030-02 until such time as a proper review of the facility and their application could be made; currently, IP continues to operate under this permit.

4.0 Discussion

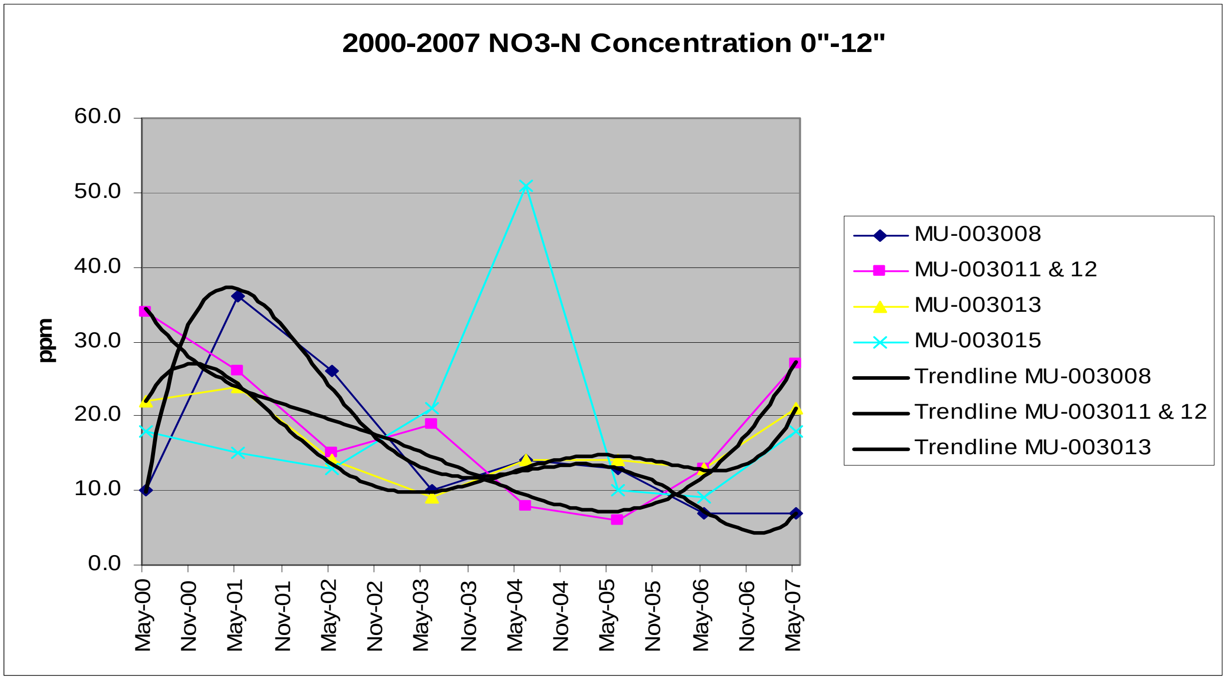
The following is a discussion of: soils, ground water, surface water, hydraulic management unit configuration, wastewater flows, constituent loading, and site management and compliance activities. Conclusions and recommendations are summarized in Section 5 below.

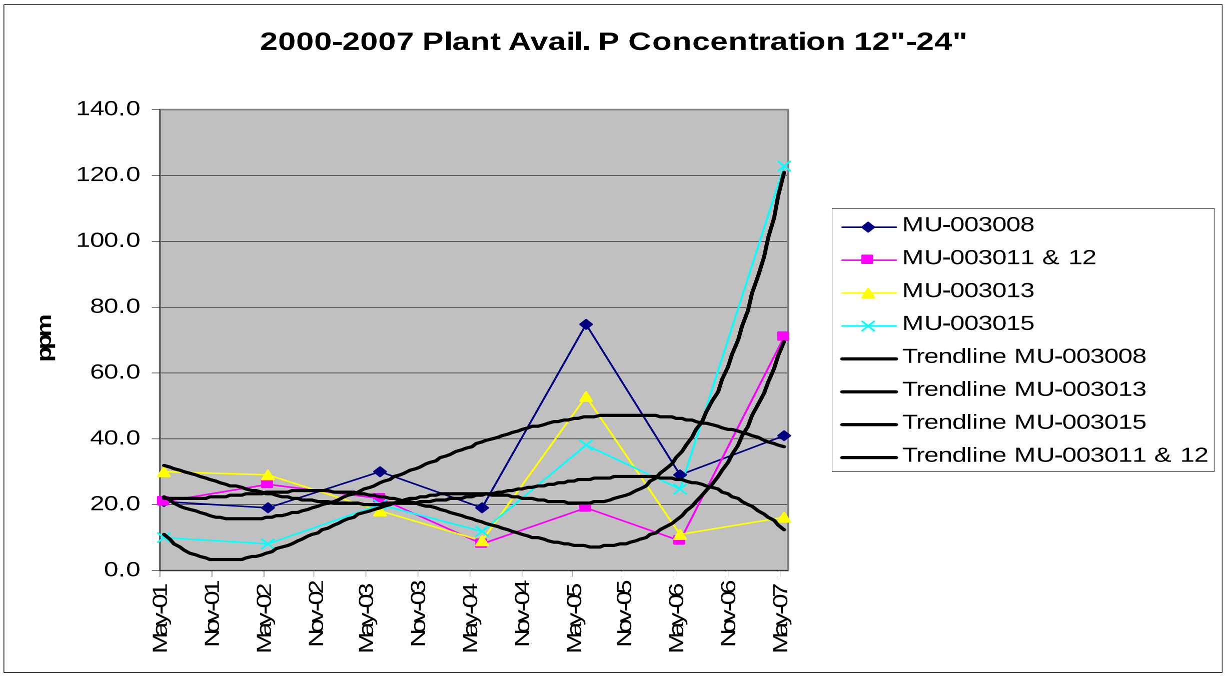
4.1 Soils

Soils on the original land application area were characterized by CES as part of the Site Characterization and Management Plan designed to fulfill compliance activity CA-030-02 of LA-000030-02 (CES, 1997). Soils at the site are formed in a mixed-source alluvium occurring on the nearly level to gently sloping terraces of the Snake River and ranging in age from Pleistocene to Recent. CES dug 30 test pits across the site and divided the area into three distinct soil mapping units: Soil Unit A, Soil Unit B, and Soil Unit C. They characterized all these soils as either brown or grayish brown loams of varying depths, turning to gravel between 22 to 60 inches below ground surface. According to CES, the available water holding capacity (AWC), or water held in the soil which is available for crop use, varies widely across the site at 11.2 inches, 8.6 inches, and 3.9 inches for soil units A, B, and C, respectively.

The National Resources Conversation Service (NRCS) Soil Survey also describes the soils onsite as a variety of loams; bannock sandy loam, bannock gravelly loam, and Heiseton loam, specifically, along with Xeric Torrifluvents. Similar to the CES survey, they are characterized as dark gray or brown sandy loams, turning to gravel between 35 to 45 inches; their AWC values, however, vary from CES's to a certain extent. The NRCS AWC values for the various soil types found at this site range from 2.64 inches to 6.02 inches, with the most common soil types having a value of 5.48 inches (NRCS, 2008). This is an obvious and important disparity which will be discussed further in Section 4.5.2.3, as the issue of acreage-weighted AWC is an integral factor in determining non-growing season hydraulic loading rates.

During CES's initial sampling nutrient levels in all three soil units ranged from average to high levels for a number of constituents, including nitrate-nitrogen. Please refer to the graphs below for soil constituent concentrations and their subsequent trends from 2000-2007.



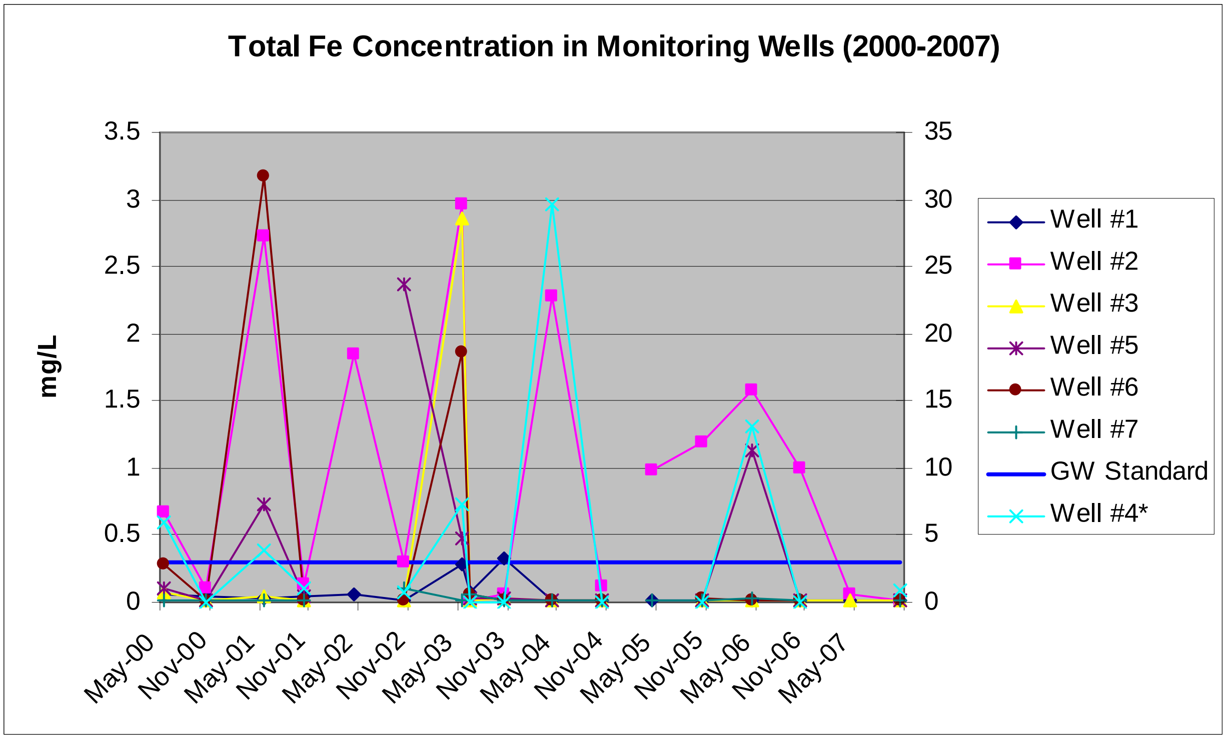


While the facility has as of yet been unable to achieve a consistent reduction of their nitrogen loading rates to the permit limit of 150% of typical crop uptake for all management units, soil nitrates do not appear to have increased drastically but rather to have declined, as evidenced by the plot above. Phosphorus levels, on the other hand, have shown what appears to be an increase over past few samplings, and on several management units are trending toward the high to very high range which is defined as 30 ppm-50 ppm and higher (DEQ, 2007). According to DEQ's Wastewater Reuse Guidance for soil with pH of greater than 6.5 the plant available phosphorus measured in the 24"-36" increment should be no greater than 30 parts per million (ppm) where there is a ground water to surface water interconnection present (DEQ, 2006). While the facility was only required to sample up to the 12-24" depth, prior to the 2006 samplings phosphorus levels in this region had been ranging upwards of 50.0-75.0 ppm. Since ground water at the site generally flows west or west north west away from the Snake River, which is located directly east and north of the facility, the ground to surface water connection is not as much of a concern; however, staff recommends that soil nitrates and phosphorus continue to be monitored annually and that composites include samplings at the 24"-36" depth where possible so as better to ascertain the depth of the elevated phosphorus levels in the upper strata and their subsequent potential to impact ground water.

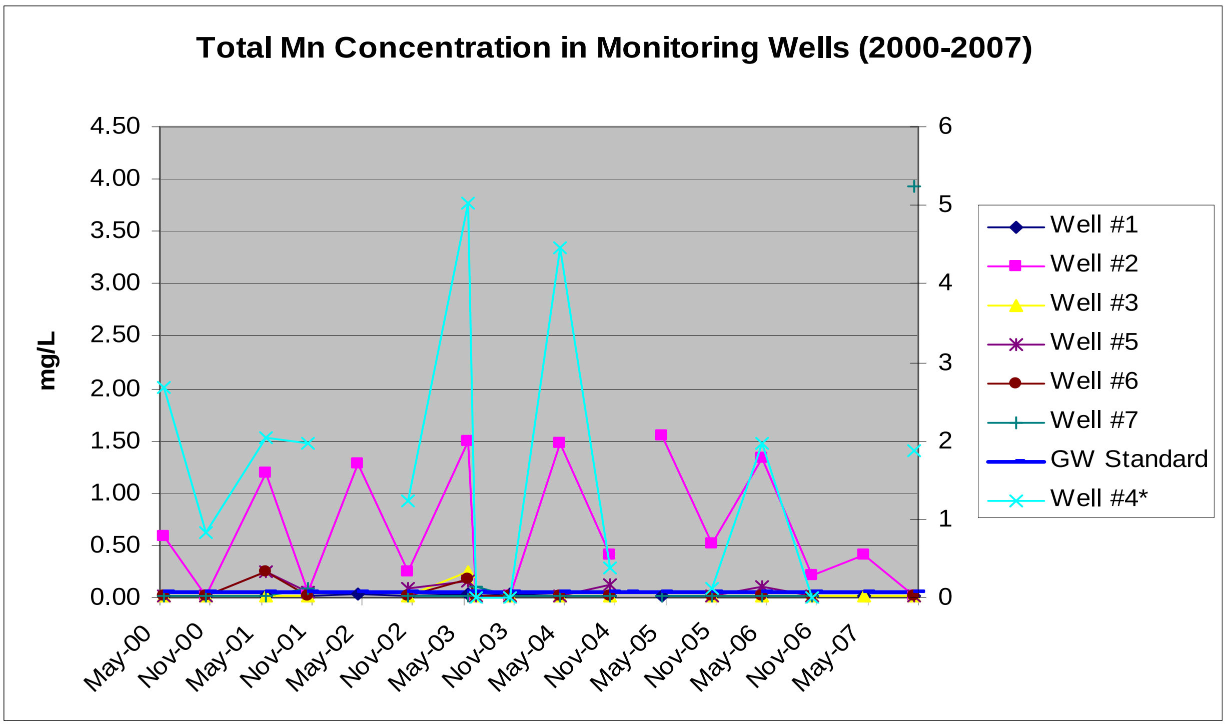
4.2 Ground Water

Idaho Pacific's ground water and ground water monitoring well network were evaluated by CES in 1997 in order to fulfill the conditions of compliance activity CA-030-08 of permit LA-000030-02. The aquifer beneath the site containing the first significant water-bearing zone is alluvial, unconfined, and is composed primarily of sand, gravel, and cobbles associated with deposits from a meandering Snake River channel. The Snake River, located immediately north and east of the site, is a losing stream in this area and provides recharge to the alluvial aquifer. In general, ground water flows in an east to west direction away from the river and does not fluctuate significantly on a seasonal basis (CES, 1997). Some of the monitoring wells do, however, show evidence of a seasonal influence from the irrigation canals in the area.

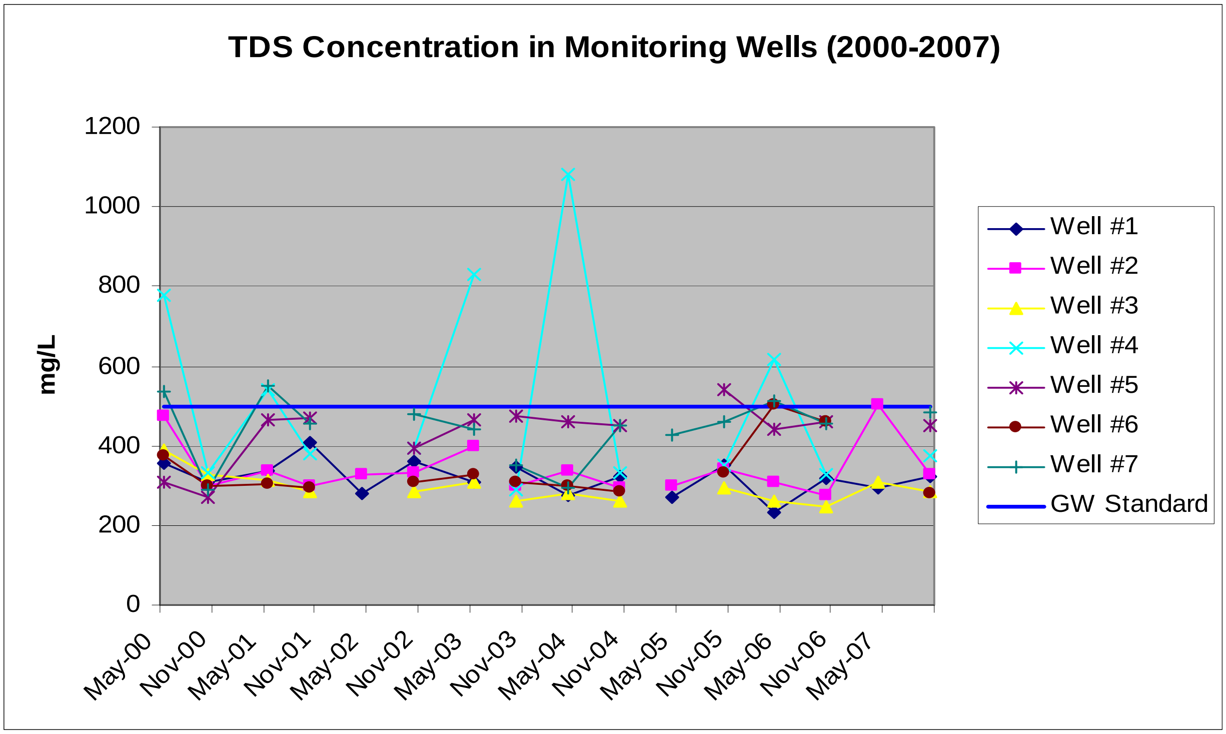
IP has a monitoring well network consisting of seven wells located within the upper portion of the first significant water-bearing zone and ranging in depth up to 39 feet below ground surface (bgs). All of the wells originally featured steel casings that extended into the water table; however, the facility upgraded all wells to PVC casings in 1999. During the process of the upgrade the facility was unable to fully remove the old steel casings from three of the wells, which may be contributing to some of the current groundwater issues; unfortunately Idaho Pacific is unable to identify which three wells still contain remnants of the old casings. Currently, each of the facility's wells is positioned to reflect down-gradient or cross-gradient water quality, with the exception of Well #1. Well #1 is located east of all management units and serves as the up-gradient well for the site (See Appendix 1, Figure 1). See the plots below for semiannual ground water monitoring trends from 2000-2006. Note: All non-detect or less than values have been designated as the laboratory's corresponding minimum reporting limit for graphing purposes and the raw ground water monitoring data may be found in Appendix 2.



* Due to the extremity of Well #4's total Fe levels as compared with the other wells, it has been plotted on a secondary axis.



* Due to the extremity of Well #4's total Mn levels as compared with the other wells, it has been plotted on a secondary axis.



As evidenced by the graphs above, the facility has shown elevated levels of total iron (Fe) and manganese (Mn) in down-gradient wells on a number of occasions. The Ground Water Quality Rule (IDAPA 58.01.11) gives the secondary constituent standards for iron and manganese as 0.3 milligrams per liter (mg/L) and 0.05 mg/L, respectively. Many samplings have exceeded these standards by a fairly significant amount, with results in several of the wells ranging from 1.00 mg/L to as high as 2.00 mg/L and above for both constituents; in Well #4 the results have been as high as 5.0 mg/L for Mn and 29.7 mg/L for Fe. The facility attributes these elevated concentrations to high turbidity levels in the wells.

Following the high results of the May 2003 sampling the facility re-sampled all of the wells in June, testing for both total and dissolved iron and manganese. While the results for total Fe and Mn in June 2003 were in general lower than the May 2003 sampling and the dissolved results were lower still, one sampling can be considered neither representative nor conclusive. See Table 1 below for a comparison of the total and dissolved results from this sampling event.

Table 1. Total and Dissovled Fe and Mn Ground Water Results for June 2003

Well	Total Fe	Dissolved Fe	Total Mn	Dissolved Mn
Well #1	0.0712	<0.010	<0.010	<0.010
Well #2	<0.010	<0.010	<0.010	<0.010
Well #3	0.0153	<0.010	<0.010	<0.010
Well #4	<0.010	<0.010	<0.010	<0.010
Well #5	0.0242	<0.010	<0.010	0.0217
Well #6	0.0592	<0.010	<0.010	<0.010
Well #7	0.0658	0.0378	**0.106**	**0.0974**

1. Bold denotes result that is in exceedance of IDAPA 58.01.11 Primary or Secondary Ground Water Standard
2. < denotes result which is less than the corresponding method reporting limit.

It should be noted, however, that in general a fair number of the high sampling results are from Well #4 and Well #2 which are located in very close proximity to the two center pivots and their relative locations could consequently contribute to both higher turbidity and higher overall constituent levels than the other down-gradient wells (See Appendix 1, Figure 1). The facility has stated that at times, particularly during rapid thaws in the non-growing season, there is standing water present around the #4 wellhead. Depending upon how often this occurs, it is probable that this could be contributing to the elevated COD, TDS, Fe, and Mn levels in the well in the spring, as ponded water at the wellhead would likely run down the casing and into the well. Also, given that the majority of the most elevated samplings appear to coincide with the spring sampling when the water levels in the wells are often at their lowest it seems probable that turbidity is indeed playing a factor in a number of the more extreme exceedances; therefore, it is recommended that the facility sample for dissolved Fe and Mn in order to more fully ascertain the role of turbidity in the site's high ground water constituent levels.

In addition to the elevated levels of total iron and manganese, high levels of total dissolved solids (TDS) have been observed periodically at the site. The Ground Water Quality Rule (IDAPA 58.01.11.200.01.b) lists the secondary constituent standard for TDS as 500 mg/L. The facility has exceeded this value on a number of occasions; in Well #4 by levels at nearly double the standard. In fulfillment of compliance activity CA-030-10 of LA-000030-02 the facility submitted a Total Dissolved Solids Management Plan which included, among other items, strategies for TDS loading which minimized ground water impacts. Since the plan's inception in 1998 TDS concentrations in the process water and consequently loadings to the land application site have not changed, but, as will be discussed further in Sections 4.5.2.1 and 4.5.2.2, appear to have decreased in recent years. While the periodic exceedances of the secondary ground water are a concern, over half of them appear to take place in the aforementioned monitoring Well #4 which could have an effect on how reflective the TDS sampling results are of overall ground water quality.

Despite the fact that, up until recently, the site had been consistently and universally overloaded with nitrogen; there has been little to no evidence of elevated nitrate levels in any of the facility's monitoring wells. In light of the facility's historic loadings, it is possible that these low levels are an indication of site-wide denitrification as a result of anaerobic soil conditions caused by oversaturation and constituent overloading during the non-growing season. For further discussion of past and future constituent and hydraulic loading rates, see Sections 4.5.2.1 and 4.5.2.3.

Monitoring Wells #2 and #4 are not the only wells in the facility's system whose water quality may be being affected by outside sources. For the past several years Monitoring Well #7, and to a lesser extent Well #6, have been showing anomalously high levels of water during the October samplings. The elevated water levels in this area, particularly around Well #7, cause ground water to flow from west to southeast during the fall rather than east to west as is the general trend at the site. The facility attributes these high sub-water conditions to seepage losses from the nearby Harrison Canal, which in turn causes subsurface ponding in the area that dissipates over the course of the winter months when the canal is dry, leading ground water flow in the area to return to normal by spring (See Appendix 1, Figure 1 and Figure 2) (CES, 2007). If this is indeed the case, the ability of Well #7, and possibly Well #6, to accurately function as down-gradient monitoring wells during the fall samplings is called into question as the water quality contained therein is likely to be more reflective of the canal than the site itself. This leaves Well #5, which happens to be located in the middle of the proposed additional acreage, as the facility's only down/cross-gradient well whose water quality does not appear to be affected by outside sources. It is due to this myriad of issues that staff recommends that the permittee be required, as a compliance condition of the permit, to submit a ground water monitoring plan which includes plans for at least two new down-gradient wells and the recompletion or replacement of the existing wells, as necessary, so that all wells, both old and new, yield samples throughout the year and are able to be sampled from as close to the water table as possible. The plan should also include the best management practices that the facility intends to employ to prevent water from ponding around or within 25 feet of the wellheads. For the full text of this condition see CA-030-03 in Section E of the permit.

4.2.1 Municipal Wells in Proximity to the Facility

In addition to the monitoring wells present at the site there are a number of domestic wells within a quarter mile radius of the facility. Compliance activity CA-030-07 of LA-000030-02 required the facility to submit chemical analytical results for all of these wells for the following parameters: total dissolved solids (TDS), nitrate-nitrogen (NO_3-N), total manganese (Mn), total iron (Fe), chloride (Cl), sulfate (SO_4), bicarbonate + carbonate (HCO_3 + CO_3), potassium (K), sodium (Na), calcium (Ca), and magnesium (Mg). Results from these tests were submitted to DEQ on June 24, 1997.

Out of the constituents sampled all were below either the applicable primary or secondary ground water standard with the exception of iron; six out of the twelve domestic wells sampled showed iron levels which were above the secondary standard of 0.3 mg/L. It is feasible, however, since the accompanying manganese levels were significantly below maximum contaminant levels that the iron is not in fact originating from the facility but rather either due to the well construction or naturally occurring in the wells themselves. In the 2002 application materials the facility stated that there are now 19 domestic wells within the vicinity of IP (CES, 2002). A well location acceptability analysis for these wells is included as a compliance condition of the permit; for full text of the condition see CA-030-02 in Section E of the permit.

DEQ also completed a source water assessment on IP's production well in 2002, which is located down-gradient from the land application site, finding that it had a moderate susceptibility for inorganic and synthetic organic contaminants such as nitrates and pesticides and a low susceptibility for volatile organic contaminants and microbial bacteria. These moderate and low susceptibility ratings were due in large part to the adequate construction of the well itself as well as the number and depth of sedimentary interbeds between the production zone and the surface (DEQ, 2002). While low levels of nitrate (below 0.5 mg/L) have been detected in the well, according the Safe Drinking Water Information System (SDWIS) no other contaminants have ever been detected in the well (SDWIS, 2007).

4.3 Surface Water

There are a variety of surface waters within the vicinity of the IP facility. The site itself is bordered directly on two sides by irrigation canals—Harrison and Dry Bed Canal join to form the northern property boundary and Enterprise Canal runs along the southern edge of the land application site. A protective berm was constructed outside the requisite 100 foot setback zone of the Dry Bed Canal as part of the Buffer Zone Management Plan required by compliance activity CA-030-06 of LA-000030-02. Besides the irrigation canals the land application site is also bordered 1.6 miles to the north and 1.8 miles to the east by the Snake River. Despite this proximity to various surface waters, and according to flood zone map submitted by CES in 2002, the IP property does not appear to be within either the 100 or 500 year flood plains for the area (CES, 2002).

4.4 Hydraulic Management Unit Configuration

There have been fairly significant changes at the facility with regard to hydraulic management unit configuration since the permit was issued in August of 1997. Originally the site was divided into one central pivot (IPC Unit 5) which covered a large, centralized portion of the site and nine smaller units (IPC Units 1-4 & 6-9), four of which were actually permitted for land application. The smaller units which lay out of reach of the central pivot were irrigated with a combination of hand lines and guns. When the facility added an additional central pivot in 1998 they were able to eliminate the majority of their other forms of irrigation, with the exception of the hand lines used in the pivot corners and the hand lines and big guns used on IPC Unit 8 (MU-003015); this unit was converted to pivot irrigation in 2007. This switch in irrigation has caused several of the smaller fields to be combined under one pivot, thereby necessitating a change in management unit designation in the permit. Besides these changes the facility also sold IPC Unit 9 (MU-003016) in 2000 and is requesting to begin land application on the previously un-permitted IPC Unit 2 (MU-003010) plus an additional 14.1 acres adjacent to this unit along the Harrison Canal. Please refer to Table 3 for a comparison of the facility's previous management units to those included in the permit.

Table 3. Management Unit Configuration

Obsolete Management Unit	Obsolete Serial Number	Acres	New Management Unit	New Serial Number	Acres
IPC Unit 1	MU-003009	29.1	None	None	None
IPC Unit 2	MU-003010	22.8	MU #1	MU-003021	22.8
IPC Unit 3*	MU-003011	45.5	MU # 2 (West Pivot)	MU-003022	107.1
IPC Unit 4*	MU-003012	20.0			
IPC Unit 5*	MU-003008	122.7	MU # 3 (East Pivot)	MU-003023	131.6
IPC Unit 6*	MU-003013	36.4			
IPC Unit 7	MU-003014	24.2	None	None	None
IPC Unit 8*	MU-003015	57.4	MU #4 (4 North & 4 South Pivots)	MU-003024	57.4
IP Unit 9	MU-003016	25.0	None	None	None
Total Permitted Acres:		**282.0**	**Total Permitted Acres:**		**318.9**

***** Indicates permitted ACTIVE management unit under LA-000030-02

In addition to the 36.9 acres of proposed additional acreage the facility states that they are also currently in the preliminary stages of identifying and obtaining further offsite acreage in an effort to meet current and future constituent loading limits (CES, 2008); this has been the case, however, for a number of years. According to the Revised Nitrogen Loading Management Plan submitted in August 2006 the facility would need to acquire a minimum of 97 offsite acres in order to reach loading limit goals (CES, 2006). As of February 2008 the facility was still in discussion with several local farmers with regard to the possibility of leasing adequate offsite acreage, but, as will be discussed further in Section 4.5.2.1, they currently feel that the proposed on site expansions will provide the means to meet permit limits in the immediate future.

4.5 Wastewater Flows and Constituent Loading Rates

Trending of wastewater flow rates and rationale for constituent and hydraulic loading rates appearing in the permit are discussed below.

4.5.1 Wastewater Flows

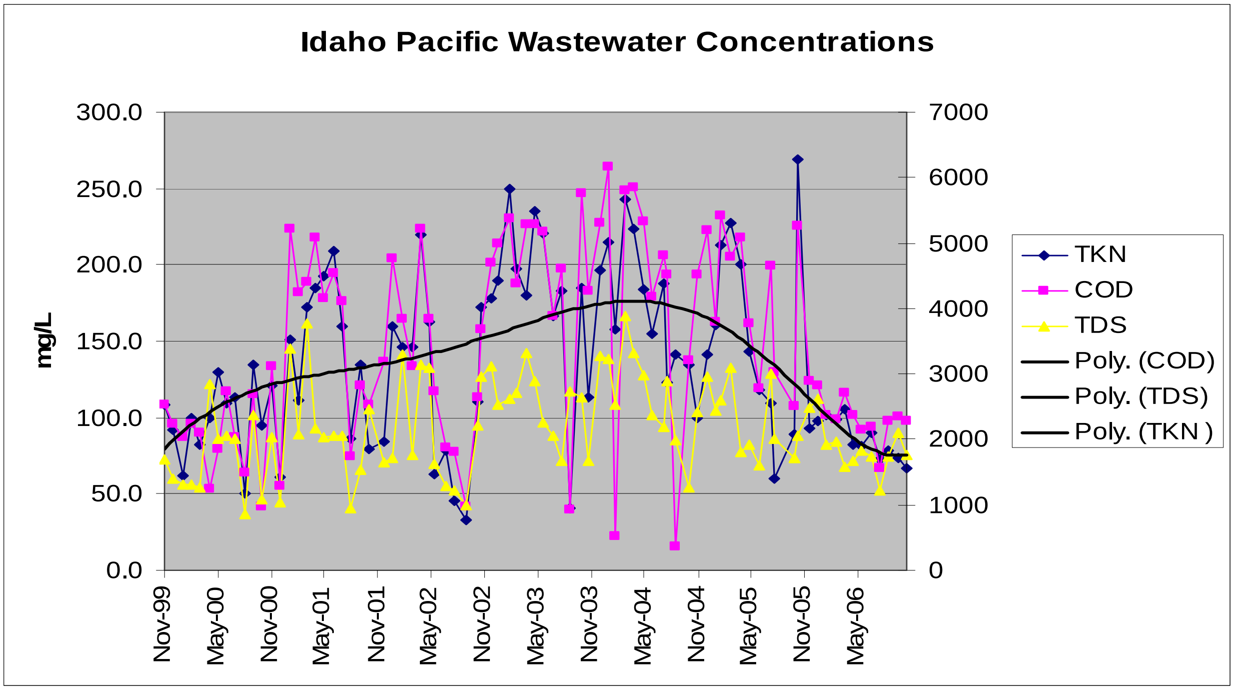
Wastewater flows decreased by approximately 55 million gallons (MG), from 187.3 MG to 132.9 MG per year, when the facility exchanged their wet scrubbers for dry ones in January 2000. Since then the flows have remained fairly constant with IP generating an average 60.5 MG during the non-growing season and 60.0 MG during the growing season for a yearly total of approximately 120.5 MG. As the facility does not have any kind of retention lagoon system, all of the process water generated is subsequently land applied.

4.5.2 Constituent Loading Rates

The sections below discuss proposed constituent loading rates, including nitrogen, total dissolved solids, hydraulic, chemical oxygen demand (COD), and phosphorus. Recommended loading rates for inclusion into the permit, Section F, are also discussed.

4.5.2.1 Nitrogen Management and Loading Rates

While permit LA-00030-02 required the facility to meet a nitrogen loading limit of 150% of typical crop uptake on all management units by September 1, 1999, this goal has never been achieved, even with the year-long DEQ-granted extension. As a result, this site has been consistently overloaded by an average of 145 pounds per acre (lbs/ac-yr) for the past six years. The facility’s treatment processes and generation rates have remained relatively constant during the course of the permit term, with aforementioned exception of the reduction in flow caused by the January 2000 scrubber replacement; however, the nitrogen, COD, and TDS concentrations of the wastewater appear to have been decreasing rather precipitously since the spring of 2004. For an illustration of this trend, see the graph below.



Under LA-000030-02, IP is required to take monthly 24-hour composite samples of their wastewater; a process which is currently performed manually. In order to improve the accuracy of these samplings and better reflect the actual quality of the wastewater and thereby the constituent loadings to the fields, it is recommended that the facility install a 24-hour composite sampler. For the full text of this condition see CA-030-10 in Section E of the permit.

As has been previously mentioned, IP has stated on several different occasions that they are currently searching for suitable land upon which to extend their land treatment operation. In 2000, when CES evaluated the additional acreage at the plant site, they estimated that the facility would need at least another 105 acres in addition to the proposed onsite acreage in order to meet the target nitrogen loading (CES, 2000). Then, in 2006, CES revised their recommendation in the facility's Nitrogen Management Plan to an additional 97 acres. However, in February 2008, in response to DEQ's request for an update on the status of the current expansion plans, the facility stated that they believed given the current loading rates and newly improved crop management practices, an immediate off-site expansion is no longer necessary (CES, 2008). Rather, it is IP's view that the additional proposed onsite acreage will be sufficient to meet current permit limits, though offsite expansion is still being considered as an option for the long term. This proposal, however, does not provide the facility with much of a buffer in the event of a year with lower than estimated crop uptake or higher than normal wastewater nitrogen concentrations, especially given the site's historic values, which are discussed below.

The facility has consistently grown grass hay for the past permit cycle with an average crop nitrogen uptake of approximately 266 lb/ac, with a minimum of 243 lb/ac in 2004, and a maximum of 309 lb/ac in 2000. Crop yields for this site have generally been rather low, with IP only managing two cuttings per season rather than three or four, which has consequently lead to lower crop uptake values. The USDA National Agricultural Statistics Service gives average crop yield for irrigated hay fields in Jefferson county between 2000-2006 as 4.81 ton/ac (NASS,

2008) whereas IP's average yield for the same time span was 3.6 ton/ac. This reduced crop yield could be attributed in large part to the lack of adequate irrigation for the fields during the growing season. Both growing and non-season hydraulic loading rates and water requirements will be discussed more fully in Section 4.5.2.3.

As the facility has asserted to their ability to meet the current permit limits with the addition of their onsite expansion and improved crop management (CES, 2008), it is recommended that they be held to the 150% of crop uptake nitrogen loading limit. However, given the site's history of poor crop production and uptake it is recommended that the facility continue to search in earnest for offsite expansion acreage to ensure that this limit can be met under any circumstances.

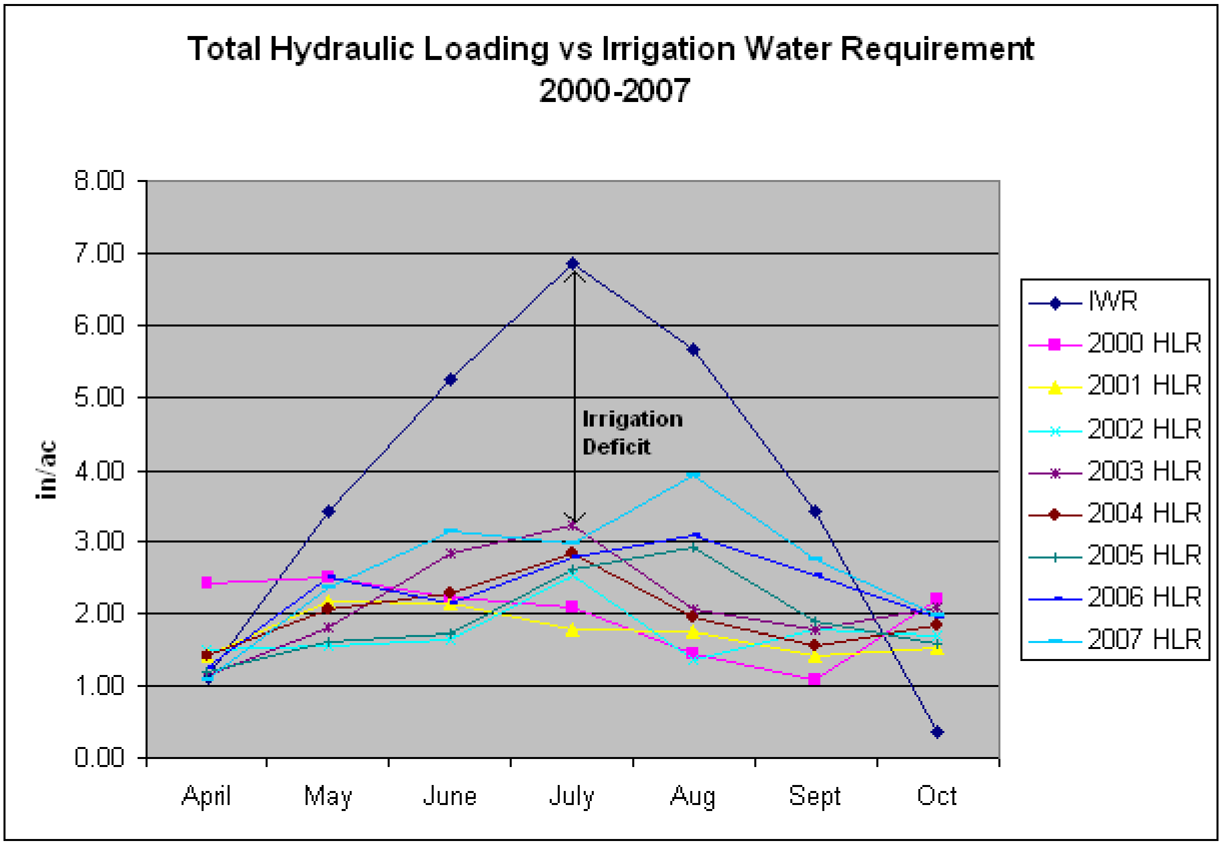
4.5.2.2 Total Dissolved Solids (TDS) Loading Rates

Total dissolved solids (TDS) loading rates from wastewater and irrigation water can have significant impacts to ground water TDS levels. Total dissolved solids measured in ground water are commonly inorganic constituents (salts). TDS in wastewater can include significant quantities of organic constituents in addition to salts. For modeling and other environmental evaluation purposes, inorganic wastewater TDS is important to measure. The current permit requires measurement of both TDS and volatile dissolved solids (VDS), the latter being a rough estimate of organic constituents. The difference between TDS and VDS is termed non-volatile dissolved solids (NVDS) and can be used as a reasonable estimate of the salts in wastewater. As has been mentioned earlier in the discussion of the site's ground water, the facility has a TDS Management Plan which was designed by CES in 1998. As was discussed earlier, TDS concentrations, along with those of several other key wastewater constituents have been experiencing a decline in recent years (see graph in Section 4.5.2.1.).

These wastewater concentrations have lead to an average NVDS loading on the land application site of 4252 lb/ac-yr, with a maximum of 5775 lb/ac-yr in 2003 and a minimum of 2120 lb/ac-yr in 2006. As has been discussed previously, there have been several instances where the monitoring wells at the facility have shown TDS levels above the acceptable ground water quality standard, pointing to some influence due to constituent loading rates. However, as the suitability of the monitoring well network itself has been called into question it is unclear as to how reflective these exceedances truly are of the effect of TDS loading rates upon the ground water at the site. Bearing this in mind, staff still recommends that, in light of the historic loading rates and in the interest of ground water protection, a 4,500 lb/ac-yr NVDS loading limit be included in the permit for each HMU.

4.5.2.3 Hydraulic Loading Rates

With proper management, growing season hydraulic loading should substantially be the irrigation water requirement (IWR) for the crop in question. Prior the 2007 growing season, due to inadequate irrigation conveyance systems, the site did not receive enough supplemental irrigation to meet the water needs of their crops. On average, the facility operated at a deficit of anywhere from 1 in/ac in April and October to over 6 in/ac in July. The graph below contains the total hydraulic loading rate (HLR) to the site for the 2000-2007 growing seasons compared with the 30 year irrigation water requirement (Allen, 2008a&b).



According to the facility, in 2007 a pump and pipeline from the Farmers' Friend Canal to the IP pump house were installed which facilitate the ability to supply adequate supplemental irrigation to the site (CES, 2008). Plans and specifications were not submitted or approved by DEQ and the methods by which these irrigation flows are being measured are currently unknown. Staff recommends that the IWR be calculated for the crop in question using 30 year average data for the area in order to ensure that this newly acquired asset is being used to the best advantage to improve both yield and nutrient uptake. In order to monitor the irrigation flows to each field; it is also recommended that the permit require the installation of flow meters to accurately and independently track and record all wastewater and irrigation water flows to each HMU. For further information on this recommendation see Section 4.8 of this document and CA-030-08 in Section E of the permit.

Currently the facility has a non-growing season hydraulic loading limit of 8.51 in/ac which was established by recommendations contained within the Site Management Characterization and Management Plan submitted in 1997 (CES, 1997). This loading rate, however, was universal over the entire site and does not account for the variable soil types within each management unit. After calculating acreage-weighted AWCs values using the soil-specific information provided by both NRCS and CES, lower, management unit specific, NGS hydraulic loading rates were calculated using the following formula:

HLR_{ngs}= Soil Available Water-Holding Capacity (AWC) – Precipitation + Evapotranspiration

Where:
AWC = Dependent upon soil unit
Precipitation = 3.7 inches (Rexburg Agrimet, Nov 1- Mar 31)
Actual Evapotranspiration = 2.9 inches (Alfalfa less freq. cuttings from Rexburg Agrimet, Nov 1- Mar 31)

The individual non-growing season hydraulic loading rates for each HMU are included in Tables 4 and 5 below.

Table 4. Non-growing Season Hydraulic Loading Rate (NRCS AWC)

HMU	Acres	Soil AWC (inches)	in/ac	MG
MU #1	22.8	4.71	3.9	2.4
MU #2	107.1	4.73	3.9	11.3
MU #3	131.6	5.01	4.2	15.0
MU #4	57.4	5.29	4.5	7.0
Total	**318.9**			**35.7**

Table 5. Non-growing Season Hydraulic Loading Rate (CES AWC)

HMU	Acres	Soil AWC (inches)	in/ac	MG
MU #1	22.8	4.78	4.0	2.48
MU #2	107.1	7.78	7.0	20.36
MU #3	131.6	7.33	6.5	23.23
MU #4	57.4	9.20	8.4	13.09
Total	**318.9**			**59.16**

Both of the calculated loading rates are lower than the 8.51 in/ac or 65.2 MG limit that has been previously permitted in part due to the fact that the AWC is being considered on an individual management unit basis. This decision was made due to the fact that a singular NGS hydraulic loading rate for the entire acreage is not truly representative of each of the hydraulic management units; if a hydraulic management unit is managed and loaded according to a site average available water holding capacity (AWC), units falling below the average would generate more percolate than would be otherwise anticipated whereas units having higher than average AWC would be under-utilized with respect to their NGS hydraulic capacity. The 8.51 in/ac limit also included a 1.1 inch leaching fraction which is unnecessary for this site and therefore not included in the current calculations.

The average hydraulic loading for the NGS for the past seven years has been approximately 56.5 MG. This, however, includes the loadings from 2000 which are substantially higher than subsequent years due to the fact that the facility was still using their wet scrubbers at the time. Since the scrubber replacement, the facility has applied an average of 51.4 MG per season; with 2005 and 2006 having been the lowest yet, at 47.0 MG and 47.7 MG, respectively. While both of the management unit specific hydraulic loading rates will ensure more adequate protection of the site's ground water than those employed currently, the rates based upon the CES AWC values appear to be the more feasible of the two; therefore it is recommended that the non-growing season loading rates be included in the permit as outlined in Table 5. However, as there is a significant difference between the NRCS and the CES characterizations of the site, it is also recommended that the facility prepare and implement a Soil Characterization Plan to reconcile the differences. This plan will include details on the re-characterization of the site's soils, including the location and number of test pits, as well as the inclusion of acreage-weighted AWCs for each new management unit. For the full text of this condition see CA-030-07 in Section E of the permit.

4.5.2.4 COD Loading Rates

Wastewater Reuse permits typically include a chemical oxygen demand (COD) permit loading rate limit of 50 pounds/acre-day (lb/ac-day) per season. During the non-growing season the facility averages, site-wide, approximately 40.7 lb/ac-day with a maximum of 49.2 lb/ac-day in 2003 and a minimum of 24.0 lb/ac-day in 2006. Meanwhile, for the growing season the average COD application is 30.0 lb/ac-day with a minimum of 22.4 lb/ac-day in 2002 and a maximum of 38.8 lb/ac-day in 2003. In light of these of historic rates as well as the expansion of IP's acreage staff recommends that the facility be held to the standard 50 lb/ac-day (seasonal average) COD loading rate which is contained in the permit.

4.5.2.5 Phosphorus Loading Rates

Currently, there is no phosphorus loading limit included in the permit as phosphorus loading rates are generally set by DEQ based upon either ground water or surface water concerns. With respect to ground water concerns, DEQ does not usually set a phosphorus loading limit where there is no ground water – surface water interconnection (i.e. where ground water discharging from the down-gradient boundary of the treatment site does not enter surface water), which is the case here. Ground water on the site flows from east to west, away from the Snake River; and while there are irrigation canals which are located immediately down-gradient of the facility, they are losing structures which contribute seepage to ground water, but not vice versa. Given an adequately designed runoff plan, including runoff structures which are appropriately constructed and maintained, phosphorus contamination to irrigation canals should not become a concern.

4.7 Buffer Zones and Site Management

In fulfillment of compliance activity CA-030-06 of permit LA-000030-02 the facility submitted a Buffer Zone Management Plan on September 15, 1997. In addition to confirming that the permit-stipulated buffer zones of 300 feet between dwellings and sprinkle irrigated sites and 100 feet between dwellings and flood irrigated sites were being maintained, the facility described plans to construct a 450 foot long berm in IP Unit 8 (now MU #4), 100 feet from the Dry Bed Canal. Also included in this plan was a buffer zone waiver request for the IP owned farmhouse located on IP Unit 7. The facility requested a 200 foot zone for the dwelling and a 300 foot well head buffer zone for the farmhouse's well (IP, 1997). It is recommended that, if there are no persons living in the dwelling, the requested buffer zones should be allowed, following the completion of an acceptable WLAA on the farmhouse's well. However, if the dwelling is utilized as such, the buffer zone distances should be as specified in the Reuse Guidance. The permit contains the standard buffer zone recommendations for industrial wastewater reuse facilities which are as follows:

- 300 ft from reuse site and inhabited dwellings
- 50 ft from reuse site and areas accessible by the public
- 100 ft from reuse site and permanent and intermittent surface water
- 50 feet from reuse site and irrigation ditches and canals
- 500 feet from reuse site and private water supply wells

— 1000 feet from reuse site and public water supply wells
— Berms and other BMPs shall be used to protect the well head of on-site wells.

If the facility desires further mitigation or modification of the farmhouse's buffer zones staff recommends that a site inspection be performed before any reductions are approved.

4.8 Plan of Operation and Other Compliance Activities

Section 1.0 of the Application (page 1) states that an updated facility plan of operation would be submitted after permit issuance as an anticipated permit compliance condition; it is understood that a plan of operation is a living document and is modified as operations and regulatory requirements change. Section E, condition CA-030-01, as it appears in the permit, requires the facility to submit for DEQ review and approval, a plan of operation which includes the checklist items found in Section 1 of the Reuse Guidance. For the full text of the condition, refer to CA-030-01, Section E of the permit.

In addition to the submission of an updated Plan of Operation, the permit also suggests that a well location acceptability analysis be performed for all domestic and municipal wells within a quarter mile radius of the facility and land application area. For the full text of the condition, refer to CA-030-02, Section E of the permit.

In order to address the aforementioned issues with the facility's existing monitoring well network a ground water monitoring plan is also included as a compliance activity. This assessment includes plans for at least two new down-gradient wells and the recompletion or replacement of the existing wells, as necessary, so that all wells, both old and new, yield samples throughout the year and are able to be sampled from as close to the water table as possible. The plan should also include the best management practices that the facility intends to employ to prevent water from ponding around or within 25 feet of the wellheads. For the full text of this condition see CA-030-03 in Section E of the permit.

A Quality Assurance Project Plan (QAPP) for monitoring required in this permit which covers field activities; laboratory analytical methods and other activities; data verification and validation; data storage, retrieval and assessment; and monitoring program evaluation and improvement. For the full text of this condition see CA-030-04 in Section E of the permit.

As several changes in site configuration and irrigation practice have occurred as well as an increase in the number of dwellings in the surrounding area, it is recommended that the facility devise a new Nuisance Odor Management Plan. For the full text of this condition see CA-030-05, Section E of the permit.

Due to the aforementioned changes in site configuration, it is also recommended that the facility submit a Runoff Management Plan. For the full text of this condition see CA-030-06, Section E of the permit.

To address the significant difference between the NRCS and CES characterizations of IP's land application site, it is recommended that the facility prepare and implement a Soil

Characterization Plan. This plan should include details on the re-characterization of the site's soils, including the location and number of test pits, as well as the inclusion of acreage-weighted AWCs for each new management unit. For the full text of this condition see CA-030-07 in Section E of the permit.

Due to recent changes in the methods of both wastewater and supplemental irrigation water conveyance and distribution at the facility, it is recommended that flow meters be installed to independently track and record all wastewater and supplemental irrigation flows to each HMU. Plans and specifications for the installation of the meters should be reviewed and approved prior to construction or installation. The meters should be of the mechanical or non-volatile memory type which prevent tampering, deleting, or any modification of the recorded total volume. A schematic of the flow network and a theory of operation should be submitted with the plans and specifications to explain how all flows to each HMU will be measured, tracked, and documented to maintain permit compliance. For the full text of this condition see CA-030-08, Section E of the permit.

As the facility has modified its process somewhat with the removal of the mud lagoons and the replacement of their clarifier it is recommend that a revised Waste Solids Management Plan be submitted. At a minimum the revised plan should address all solids generated through the wastewater treatment process including: waste (tare) potatoes, Imhoff tanks, clarifier solids, filter drum, hydrosieve, and any other equipment that generates waste sludge or other solids. For the full text of this condition see CA-030-09 in Section E of the permit.

To create a more accurate reflection of the facility's wastewater constituent concentrations and therefore the loadings to the site, the permit requires that a 24-hr composite sampler be installed rather than continuing to composite the wastewater samples by hand. For the full text of this activity, see CA-030-10, Section E of the permit.

4.8.1 Summary of Compliance Activities from LA-000030-02

Compliance Activity CA-030-01 required the submission of a Site Management Plan which included plans to implement: a) both nutrient and hydraulic loading at guideline rates; b) non-growing season COD loading rates no greater than 50 lb/ac-day (monthly average); c) guideline non-growing season hydraulic loading rates. This activity was due on December 15, 1997 and was submitted to DEQ on January 7, 1998. The recommended NGS hydraulic loading rate of 8.51 in/ac was accepted by the Department and subsequently utilized as the permit limit. Due to changes in both hydraulic and nutrient loading rates for both the growing and non-growing season the majority of the components of this plan are no longer applicable and a revised Site Management Plan should be included as part of the Plan of Operation (Compliance Activity CA-030-01 of the permit).

Compliance Activity CA-030-02 required that the facility submit a study pertaining to the efficacy of their clarifier and a schedule of improvements as deemed necessary. This activity was due September 1, 1997 and the facility replaced the clarifier in September of 1997.

Compliance Activity CA-030-03 required the facility to submit seepage test data for their mud lagoons by November 1, 1997 and Compliance Activity CA-030-04 required that the facility submit plans to either repair or abandon said lagoons if they failed to meet seepage test requirements. These plans were to have been submitted by December 15, 1997. The lagoons were abandoned as part of a later agreement with DEQ in November of 2001.

Compliance Activity CA-030-05 required the facility to submit a modified Waste Solids Management Plan which addressed the management of all waste solids associated with the wastewater treatment system. The management plan was due on September 15, 1997 and was submitted to DEQ on September 25, 1997. As the facility has modified its process somewhat with the removal of the mud lagoons and the replacement of their clarifier this plan is no longer applicable and a revised Waste Solids Management Plan will be required by CA-030-09 of the new permit. At a minimum the revised plan must address all solids generated through the wastewater treatment process including: waste (tare) potatoes, Imhoff tanks, clarifier solids, filter drum, hydrosieve, and any other equipment that generates waste sludge or other solids.

Compliance Activity CA-030-06 required the facility to submit a Buffer Zone Plan which delineated buffer zones between both inhabited dwellings and public areas and the land application site. The due date for this plan was also September 15, 1997 and it was submitted to DEQ on that date. As IP has modified their land application process by a fairly significant extent with the addition of more pivot irrigation and expansion of acreage, this plan is no longer applicable to the site. A revised Buffer Zone Plan should be included as part of the Plan of Operation (Compliance Activity CA-030-01 of the permit).

Compliance Activity CA-030-07 required the facility to submit chemical analytical results for all of the domestic and municipal wells within ¼ mile of the facility and the wastewater reuse sites for a number of parameters. This activity was due by November 15, 1997 and the results of the samplings of 12 domestic wells were submitted to DEQ on June 24, 1997. In the permit renewal application submitted in 2002 the facility stated that there are now 19 domestic within the ¼ radius of the facility. Given this increase in development in the area, the permit contains a provision which calls for well location acceptability analyses to be performed on these wells (see Compliance Activity CA-030-02 of the permit).

Compliance Activity CA-030-08 required the facility to submit an evaluation of their ground water monitoring network by October 15, 1997. The Evaluation of Existing Ground Water Monitoring Network was submitted on December 2, 1997 and the facility upgraded their well casings in 1999. However, due to changes in management unit configuration the ground water monitoring network may no longer be adequate. A new ground water monitoring plan is required by Compliance Activity CA-030-03 of the permit which calls for new down-gradient wells and improvements to the remainder of the existing wells so that all wells, both old and new, yield samples throughout the year. The plan should also include the best management practices that the facility intends to employ to prevent water from ponding around the wellheads. See Section 4.2 of this document or Section E of the permit for further information on the requirements new ground water monitoring plan.

Compliance Activity CA-030-09 required the facility to bury the mainlines on Management Units MU-003011 and MU-003013 by September 1, 1998. The facility buried these mainlines in October of 1997 and in 1999 added an additional line to facilitate better access to the corners of MU-003012 and MU-003008.

Compliance Activity CA-030-10 required the facility to submit a TDS Management Plan which identified the sources of TDS in all waste streams and propose management strategies to minimize their loading on the land application acreage. This plan was due on September 1, 1998 and was submitted to DEQ on September 2, 1998. In light of the historic loading rates and in the interest of ground water protection, a 4,500 lb/ac-yr NVDS loading limit be included in the new permit for each HMU.

Compliance Activity CA-030-11 required the facility to abandon the emergency sump overflow system which caused discharge to MU-003009. This practice was to be discontinued by December 31, 1997. The overflow was subsequently abandoned in 1997.

Compliance Activity CA-030-12 required the facility to submit a final Plan of Operation by December 1, 1998. This plan was submitted to DEQ on November 30, 1998; however, in light of the adjustments in the management units and changes in the treatment and irrigation systems this plan is no longer applicable to the site. A revised Plan of Operation is included as Compliance Activity CA-030-01 in the permit.

Compliance Activity CA-030-13 required the facility to submit a Modified Nuisance Odor Management Plan by September 1, 1997. The plan was submitted on September 8, 1997; however, with the additional pivot irrigation now employed on the site and the removal of the mud lagoons this plan is no longer applicable. A revised Nuisance Odor Management Plan is required by CA-030-05 of the new permit.

Compliance Activity CA-030-14 required the facility to construct berms between the land application fields and the Dry Bed Canal by December 31, 1997. The berms were constructed in the fall of 1997 and were maintained as of 2006 inspection (DEQ, 2006).

Compliance Activity CA-030-15 required the facility to meet with the Department at least six months before August 11, 2002, the permit expiration date, for a pre-application conference. IP met with DEQ on April 17, 2002 to discuss permit renewal and the subsequent application was submitted on August 7, 2002.

5.0 Conclusion

The following recommendations fall into three major areas. They include loading rate related recommendations, ground water related recommendations, and other recommendations.

5.1 Loading Rate Related Recommendations

1. It is recommended that all hydraulic management units be managed and loaded hydraulically during the NGS according to rates calculated for each hydraulic management unit, discussed in Section 4.5.2.3. See Section F of the permit.

2. COD loading rates should be 50 lb/acre-day for both the growing and non-growing seasons as discussed in Section 4.5.2.4. See Section F of the permit.

3. It is recommended that all management units have a nitrogen loading rate of 150% of typical crop uptake as discussed in Section 4.5.2.1. See Section F of the permit.

4. It is recommended that all management units have a NVDS loading rate of 4,500 lbs/ac-yr as discussed in 4.5.2.2. See Section F of the permit.

5.2 Ground Water Related Recommendations

1. It is recommended that the ground water monitoring network be revised and re-evaluated as needed to properly monitor the site as discussed in Section 4.2. See Compliance Activity CA-030-03 in Section E of the permit.

2. It is also recommended that a well location acceptability analysis be preformed for all municipal and domestic wells located within a quarter mile radius of the facility and the land application site. See Compliance Activity CA-030-02 in Section E of the permit.

5.3 Other Recommendations

It is recommended that Old IPC Unit 2 (now called MU #1) be permitted for land treatment and that the management unit designations be revised as discussed in Section 4.4. See Section F of the permit.

6.0 References Cited

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Appendix 1

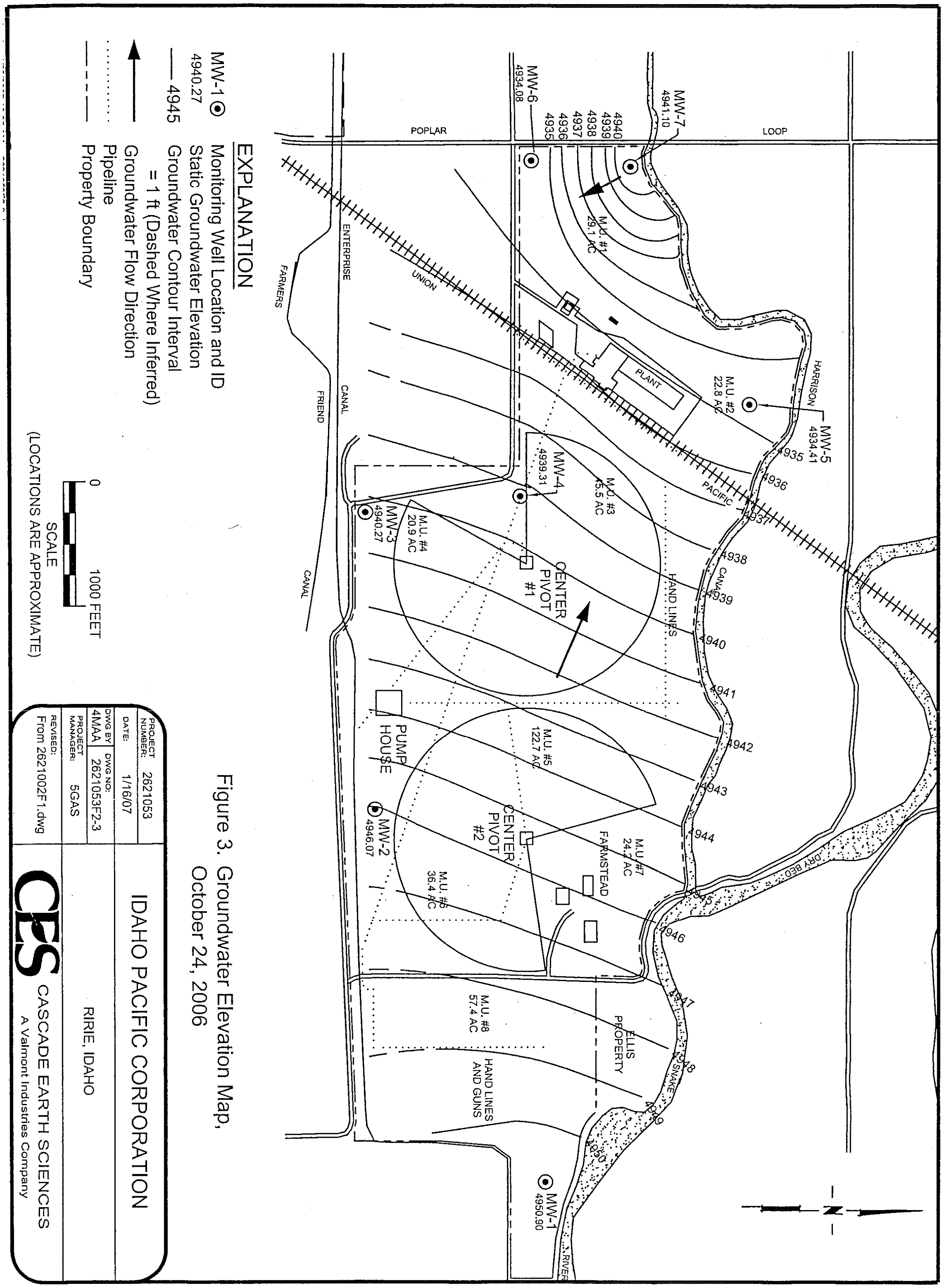

Figure 1. CES Groundwater Elevation Map, October 24, 2006

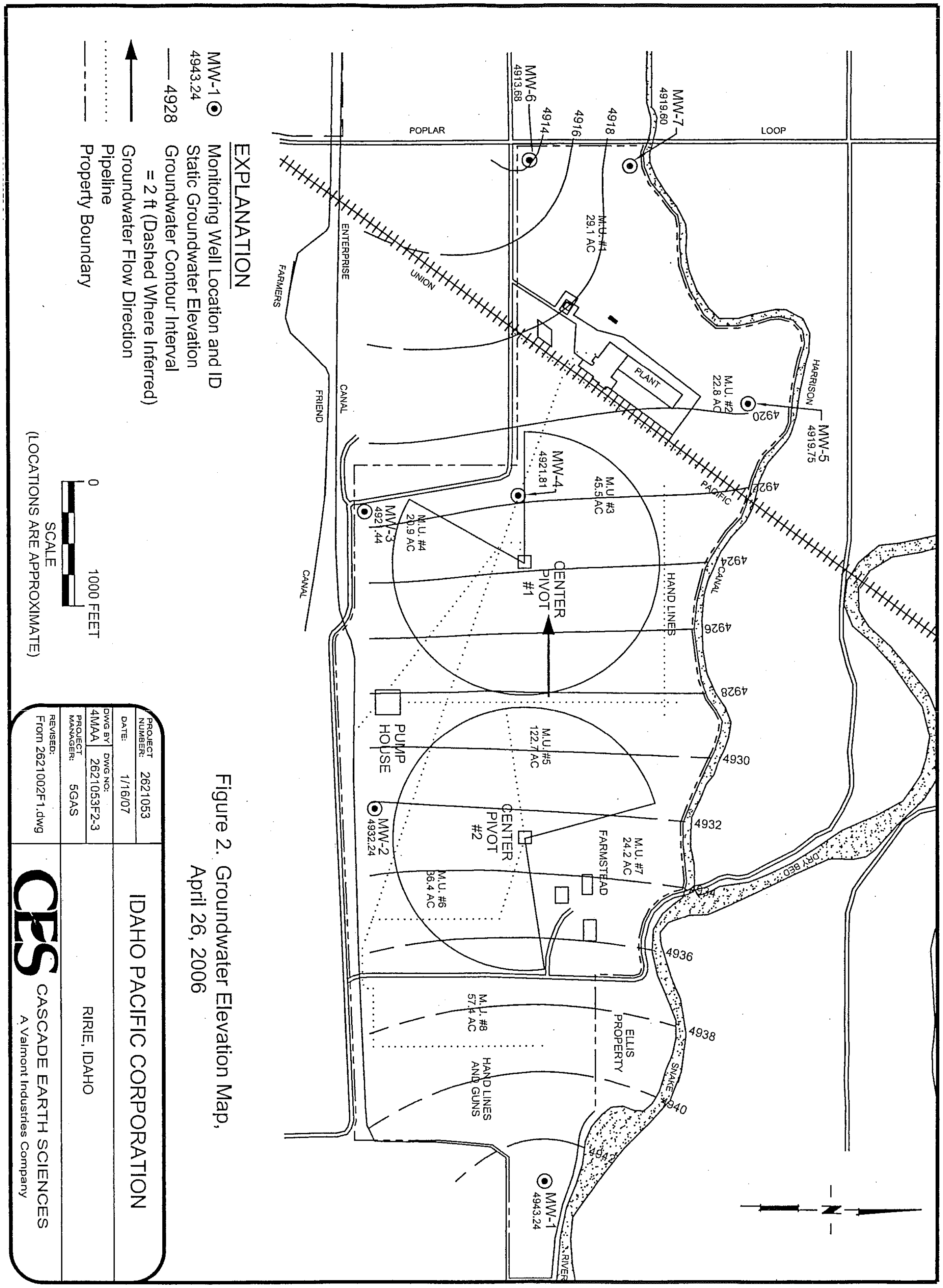

Figure 2. CES Groundwater Elevation Map, April 26, 2006

Appendix 2

Table 2. Spring and Fall Ground Water Sampling Results 2000-2006

Date	Well	NO_3-N	COD	TDS	Total Fe	Total Mn	Cl
May '00	Well #1	<5.00	<2.00	358	0.061	<0.010	10.6
Oct '00	Well #1	<5.00	<2.00	307	0.051	<0.010	11.9
May '01	Well #1	<0.250	<2.00	337	0.023	<0.010	20.0
Oct '01	Well #1	1.240	<2.00	406	0.042	<0.010	13.4
April '02	Well #1	0.740	<1.00	279	0.065	0.033	25.6
Oct '02	Well #1	0.584	<2.00	361	<0.010	<0.010	12.6
May '03	Well #1	<0.500	<2.00	306	0.285	0.041	13.3
Oct '03	Well #1	<0.500	<2.00	346	**0.322**	0.038	13.2
April '04	Well #1	<0.500	<2.00	275	0.019	<0.010	13.8
Oct '04	Well #1	6.760	<2.00	324	<0.010	<0.010	18.7
April '05	Well #1	2.280	<2.00	268	<0.010	<0.010	17.9
Oct '05	Well #1	5.700	<2.00	351	<0.010	<0.010	16.9
April '06	Well #1	0.500	6.00	234	<0.010	<0.010	12.8
Oct '06	Well #1	0.300	4.00	320	<0.010	<0.010	13.9
May '00	Well #2	<5.00	<2.00	474	**0.670**	**0.593**	10.8
Oct '00	Well #2	<5.00	<2.00	301	0.104	0.020	13.7
May '01	Well #2	<0.250	<2.00	339	**2.720**	**1.190**	10.7
Oct '01	Well #2	<0.250	<2.00	300	0.137	**0.060**	11.5
April '02	Well #2	0.960	<1.00	329	**1.840**	**1.280**	11.4
Oct '02	Well #2	1.460	<2.00	330	**0.303**	**0.244**	10.4
May '03	Well #2	<0.500	<2.00	399	**2.970**	**1.490**	17.5
Oct '03	Well #2	<0.500	<2.00	298	0.054	0.013	12.5
April '04	Well #2	<0.500	14.00	335	**2.280**	**1.470**	9.0
Oct '04	Well #2	5.74	11.00	294	0.126	**0.412**	16.8
April '05	Well #2	2.04	<2.00	300	**0.980**	**1.550**	12.7
Oct '05	Well #2	<5.00	<2.00	343	**1.190**	**0.523**	13.5
April '06	Well #2	<0.500	15.00	307	**1.580**	**1.340**	12.5
Oct '06	Well #2	<0.500	8.00	274	**0.994**	**0.212**	9.2
May '00	Well #3	<5.00	<2.00	388	0.075	<0.010	10.6
Oct '00	Well #3	<5.00	<2.00	329	0.014	<0.010	10.3
May '01	Well #3	<0.25	<2.00	312	0.042	<0.010	10.0
Oct '01	Well #3	<0.50	<2.00	283	0.017	<0.010	12.2
April '02	Well #3	DRY	DRY	DRY	DRY	DRY	DRY
Oct '02	Well #3	0.41	<2.00	286	<0.010	<0.010	10.4
May '03	Well #3	3.28	<2.00	308	**2.86**	**0.243**	12.1
Oct '03	Well #3	<0.50	<2.00	262	0.023	<0.010	12.6
April '04	Well #3	<0.50	<2.00	278	<0.010	<0.010	10.9
Oct '04	Well #3	5.74	9.00	260	<0.020	0.012	15.8
April '05	Well #3	DRY	DRY	DRY	DRY	DRY	DRY
Oct '05	Well #3	<5.00	<2.00	296	<0.010	<0.010	13.1
April '06	Well #3	0.60	15.00	259	<0.010	<0.010	12.2
Oct '06	Well #3	0.12	16.00	249	<0.010	<0.010	9.3
May '00	Well #4	<5.00	<2.00	**778**	**5.980**	**2.670**	29.5
Oct '00	Well #4	<5.00	<2.00	334	0.055	**0.834**	14.4
May '01	Well #4	<0.500	<2.00	**541**	**3.810**	**2.050**	25.9
Oct '01	Well #4	<0.500	<2.00	381	**1.040**	**1.960**	14.0
April '02	Well #4	DRY	DRY	DRY	DRY	DRY	DRY
Oct '02	Well #4	<0.500	<2.00	393	**0.711**	**1.230**	11.8
May '03	Well #4	<0.500	<2.00	**832**	**7.260**	**5.030**	60.2
Oct '03	Well #4	<0.500	<2.00	291	0.012	<0.010	12.2
April '04	Well #4	<0.500	66.00	**1080**	**29.700**	**4.470**	72.1
Oct '04	Well #4	5.740	<2.00	332	<0.010	**0.379**	18.3
April '05	Well #4	DRY	DRY	DRY	DRY	DRY	DRY
Oct '05	Well #4	<5.00	<2.00	351	<0.010	**0.127**	14.2

April ‘06	Well #4	<0.500	71.00	**618**	**13.100**	**1.980**	50.9
Oct ‘06	Well #4	1.300	17.00	328	<0.010	<0.010	19.0
May ‘00	Well #5	<5.00	<2.00	308	0.100	0.014	11.2
Oct ‘00	Well #5	<5.00	<2.00	272	<0.010	<0.010	9.4
May ‘01	Well #5	<0.500	<2.00	464	**0.725**	**0.250**	16.8
Oct ‘01	Well #5	<0.500	<2.00	470	0.041	**0.054**	21.0
April ‘02	Well #5	DRY	DRY	DRY	DRY	DRY	DRY
Oct ‘02	Well #5	<0.500	<2.00	393	**2.370**	**0.084**	21.3
May ‘03	Well #5	1.110	<2.00	464	**0.471**	**0.168**	20.8
Oct ‘03	Well #5	<0.500	<2.00	472	0.031	0.022	20.4
April ‘04	Well #5	<0.500	<2.00	459	<0.010	0.020	22.0
Oct ‘04	Well #5	6.760	<2.00	450	<0.010	**0.125**	27.7
April ‘05	Well #5	DRY	DRY	DRY	DRY	DRY	DRY
Oct ‘05	Well #5	7.900	<2.00	**539**	<0.010	0.020	27.6
April ‘06	Well #5	3.500	10.00	439	**1.130**	**0.100**	32.4
Oct ‘06	Well #5	2.000	13.00	459	<0.010	<0.010	29.6
May ‘00	Well #6	<5.00	<2.00	374	0.289	0.017	8.9
Oct ‘00	Well #6	<5.00	<2.00	298	<0.010	<0.010	9.5
May ‘01	Well #6	<0.250	<2.00	304	**3.170**	**0.252**	9.3
Oct ‘01	Well #6	<0.500	<2.00	293	<0.010	<0.010	22.7
April ‘02	Well #6	DRY	DRY	DRY	DRY	DRY	DRY
Oct ‘02	Well #6	<0.500	<2.00	309	<0.010	<0.010	9.74
May ‘03	Well #6	0.850	<2.00	326	**1.860**	**0.180**	13.4
Oct ‘03	Well #6	<0.500	<2.00	308	0.013	<0.010	11.1
April ‘04	Well #6	<0.500	<2.00	298	<0.010	<0.010	11.0
Oct ‘04	Well #6	6.210	<2.00	284	<0.010	<0.010	18.1
April ‘05	Well #6	DRY	DRY	DRY	DRY	DRY	DRY
Oct ‘05	Well #6	<5.00	<2.00	330	0.033	<0.010	13.6
April ‘06	Well #6	0.600	13.00	**503**	0.010	0.020	31.6
Oct ‘06	Well #6	<0.500	22.00	462	<0.010	<0.010	31.1
May ‘00	Well #7	<5.00	<2.00	**538**	0.016	<0.010	12.5
Oct ‘00	Well #7	<5.00	<2.00	290	<0.010	<0.010	9.4
May ‘01	Well #7	<0.500	<2.00	**548**	<0.010	<0.015	19.7
Oct ‘01	Well #7	<0.500	<2.00	454	<0.010	0.084	20.5
April ‘02	Well #7	DRY	DRY	DRY	DRY	DRY	DRY
Oct ‘02	Well #7	<0.500	<2.00	477	0.101	0.019	23.4
May ‘03	Well #7	<0.500	<2.00	442	<0.010	<0.010	12.1
Oct ‘03	Well #7	<0.500	<2.00	353	0.011	<0.010	17.8
April ‘04	Well #7	<0.500	11.00	295	<0.010	<0.010	16.3
Oct ‘04	Well #7	5.710	<2.00	449	<0.010	0.010	24.3
April ‘05	Well #7	5.800	<2.00	425	<0.010	<0.010	25.5
Oct ‘05	Well #7	<5.00	<2.00	462	0.012	<0.010	19.8
April ‘06	Well #7	0.700	15.00	**511**	0.030	0.020	30.2
Oct ‘06	Well #7	<0.500	23.00	457	<0.010	<0.010	31.1

1. Bold denotes result that is in exceedance of IDAPA 58.01.11 Primary or Secondary Ground Water Standard.
2. Permit required samplings to be performed in April and October of each year.
3. < denotes result which is less than the corresponding method reporting limit.
4. All results are given in mg/L unless labeled otherwise.